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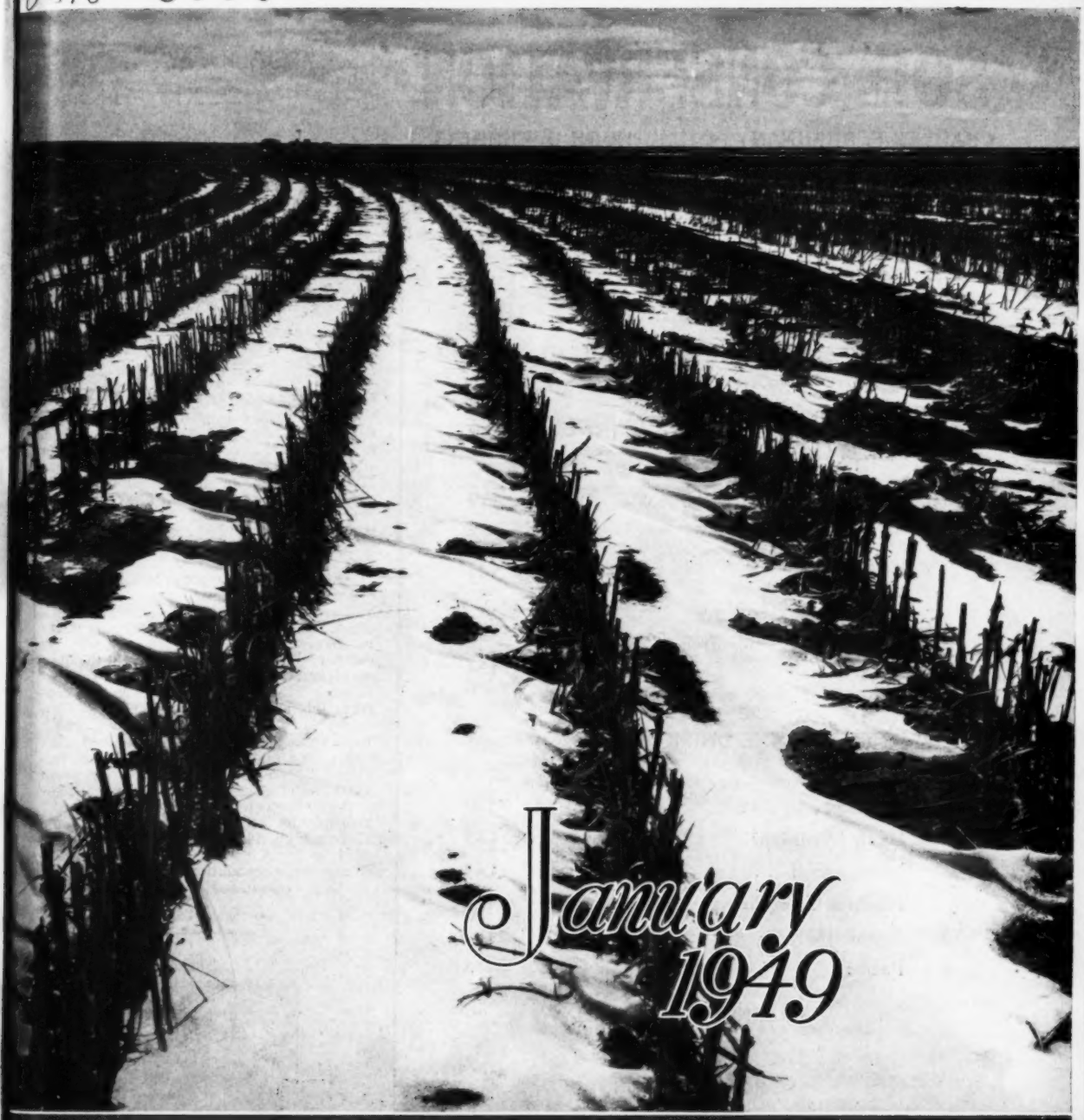

SOIL CONSERVATION

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CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE

HUGH H. BENNETT
CHIEF, SOIL CONSERVATION SERVICE

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WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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GOLF REPLACES GULLIES.—A group of enthusiasts recently purchased an eroded, run-down farm located halfway between Logan and Missouri Valley, Iowa. This 76-acre plot of land will be the Logan-Missouri Valley Country Club Golf Course.

Realizing the seriousness of erosion and soil depletion on the farm, the improvement committee called on Harry R. Acrea, chairman of the Harrison County Soil Conservation District, Iowa, for assistance and advice in solving the problems.

Acrea took complete charge of the farm and secured the assistance of SCS technicians. A comprehensive survey was made to determine the most feasible way to control upland erosion and prevent flooding on 15 acres of bottom land. With this detailed survey as a start, a complete conservation plan was developed. The plan called for the following measures, which were applied on the land in the spring of 1948: Two and a half miles of level terraces; 2,800 feet of diversion terraces; 4,000 feet of grassed waterways; 1,000 feet of 2-way open channel diversion ditch; and a drop inlet detention dam 400 feet long, 17 feet high, 14 feet top with side slopes of 4 to 1. A complete seeding and fertilizer recommendation was included.

(Continued on page 124)

FRONT COVER.—Grain sorghum stubble grown on contour traps snow and holds it against the wind at the soil conservation experiment station at Amarillo, Tex. See Hugh Bennett's article, "Land Facts," in this issue. The photograph is by Hermann Postlethwaite.

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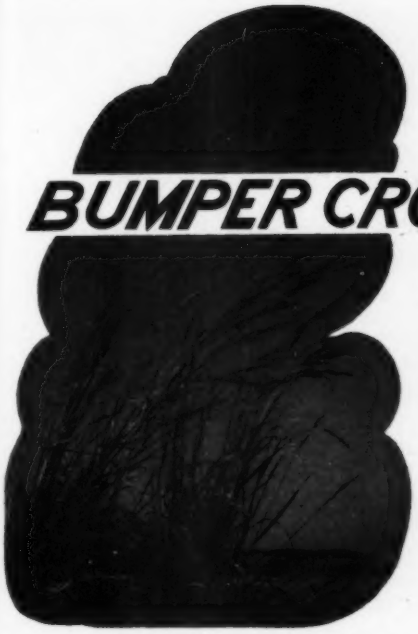
BUMPER CROP of NATIVE GRASS Seed



Two Indian grass plants, heads filled with seed.

By H. M. CHAMBERS

THE biggest harvest of native grass seed in the Nation's history took place in northeastern Oklahoma during the first half of October. Combines ran from dawn till dark. The yields filled every available square foot of storage, including a good part of the huge Douglas Aircraft factory at Tulsa.

The native grass—the big and little bluestems, Indian grass, switchgrass, and side-oats grama—was the best since Oklahoma first was settled. Even the old timers can't remember a year when northeastern Oklahoma prairies had such a magnificent stand of vegetation.

Good June and July rains, followed by more moisture late in August, helped the plants along. It was not unusual to find entire sections under grass 9 feet high.

The grass seed harvest was instigated by the Soil Conservation Service. The agency wanted enough seed to plant a million depleted acres up and down the Washita River in western Oklahoma. Revegetating these lands is part of the $11,000,000 flood control program which SCS and the soil conservation districts are carrying on for that watershed.

Soil conservation districts, private operators, and the Soil Conservation Service all participated in the seed harvest. Roughly, they combined a huge crescent surrounding Tulsa on the north, east, and south.

More than 1,500,000 pounds of seed were brought in from the prairies. All of that seed had to be spread out in layers no more than 6 inches thick. That's because native grass seed heads—unlike wheat or oats—ripen unevenly. The seeds at the top of a plant may be dead ripe and ready to shatter while those lower down on the same plant may remain green. Scattering the combined material in the thin layers allows the seed to dry without damage.

The Soil Conservation Service operated 70 large combines, most of them self-propelled, and 15 smaller pull-type machines. Contract combine crews, many recently returned from the wheat harvest, owned and ran the equipment. A fourth of the seed harvest was given to owners of the land.

The Caney Valley Soil Conservation District, Bartlesville, and the Okmulgee County Soil Conservation District, Okmulgee, did their own harvesting. The Caney Valley district owns a small combine and contracted two others; the Okmulgee unit contracted seven small combines.

NOTE.—The author is state conservationist, Soil Conservation Service, Oklahoma City, Okla.

Bob Hartley, 21-year-old rancher of Vinita, made the largest single private harvest. He had 17 large combines which cut an estimated 450,000 pounds of seed. Part of Hartley's seed has been optioned to a Texas firm.

Another individual operator was Claude Kilpatrick of Bartlesville, who harvested more than 25,000 pounds. Other private operators were at Pawnee, Nowata, Miami, and Newkirk.

The harvest got under way the last few days in September, after a warm-up the last week of August on side-oats grama. That plant yielded 50,000 pounds of seed, most of which was bought by the Soil Conservation Service for the Washita watershed. The bluestems did not ripen until October.

More than 150,000 pounds of bluestem seed were cut daily. Some acres yielded 300 pounds each.

Clarence E. Bunch, of Geary, was in charge of the main SCS harvest. He is an agronomist working on the Washita. He had expressed the hope that 1,000,000 pounds of seed could be obtained—a figure which was topped before cutting was half done.

All the seed which Bunch and his crews harvested will be used in Oklahoma during the next 3 years. James E. Smith Jr., of Woodward, an SCS nursery manager, harvested a 1-year supply of seed for use on the Trinity and Middle Colorado River watersheds of Texas, where there are district and flood-control projects. He operated 16 combines north of Vinita.

In addition to the storage facilities at the Douglas Aircraft plant in Tulsa, the combined seed was placed in barns, fairgrounds, aircraft hangars, and privately owned buildings from Coffeyville, Kans., to Okmulgee, Okla. Several large Army buildings at Camp Gruber, Muskogee, also were utilized.

Rain and wind, according to Bunch, would have ended the harvest in a day. "If there had been a beating rain or a sustained high wind, the grass would have gone down and the seed shattered. We had 1 day of fairly high wind which knocked most of the Indian grass out of the seed heads. If the bluestems had been dead ripe then we would have lost it."

Bunch explained that native grasses don't make a seed crop every year. "They'll average some seed about 1 year in 4; they'll make good seed about 1 year in 20," he said.

Native grasses speed up recovery. Bunch reports that nature will bring most idle land or well-managed range land back to a soil-holding cover of good grass in a period of 6 to 12 years, but that the same job often can be done in 3 to 5 years by artificial reseeding. Special seed drills with fertilizer attachments have been developed to plant the native grass seed. Those seeds are planted in their trashy state, just as they come from the combine.

SEED HARVEST AT FULL BLAST

1. Scalper used to clean up bluestem seed. This is in barn of Claude Kilpatrick, near Bartlesville. Crew members are Frank Zoski, Cecil Zoski, and James Whitson.

2. Self-propelled combine going through tall big bluestem grass on T. J. Stockton Ranch. This stand went better than 150 pounds to the acre. Owner of the machine operated under contract with the Soil Conservation Service.

3. Switchgrass. These plants were about 7 feet tall. Their seed was almost dead ripe.

4. Hangar at Coffeyville, Kans., airport to store seed of bluestem grasses harvested in northeastern Oklahoma.

5. Three self-propelled combines operating under contract in cutting big and little bluestem and Indiangrass, Upper Verdigris Soil Conservation District.

6. Clarence E. Bunch reaches up to heads of big bluestem grass soon to be harvested. He is Washita River flood-control agronomist, in charge of the seed harvest in northeastern Oklahoma.

7. Big bluestem grass about 9 feet tall. Their seed is ripe.

8. Unloading bluestem seed in the mile-long aircraft plant at Tulsa. Clarence Day and D. B. Clagg are in the truck; W. L. Elliot on the ground. This seed is from Coweta, near Broken Arrow.

9. One plant of little bluestem 3½ feet tall, seed about ripe.

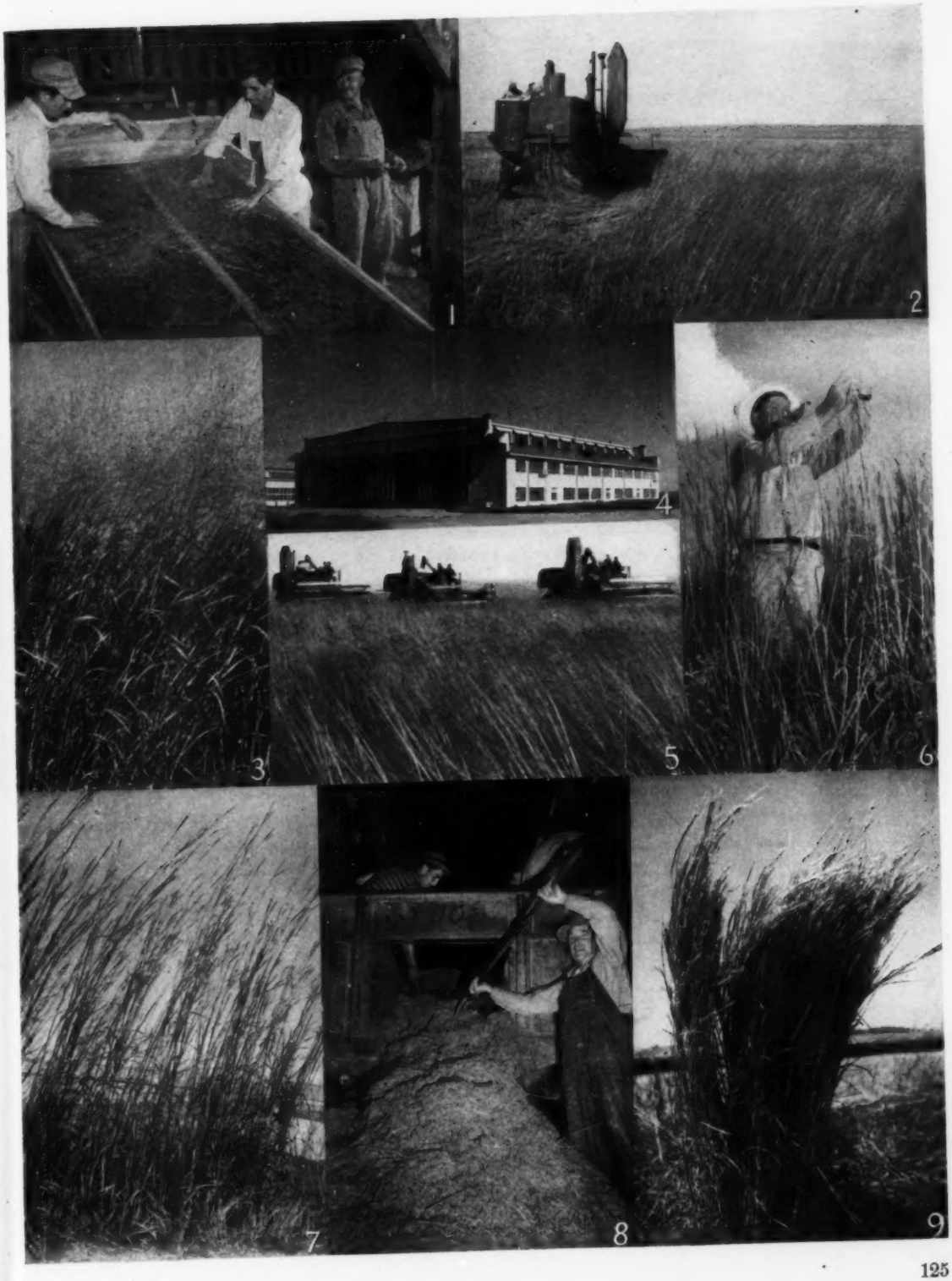
(Continued from page 122)

These practices were necessary to reduce runoff from the upland and to ease the flooding of the bottom land. The diversion terraces discharge the runoff water from an adjoining farm into the grassed waterway. The grassed waterway will empty into a 1½-acre pond. This fall the pond will be stocked with bass and bluegills. The detention dam will not only stop the ugly gully, but will also create a recreation site for club members.

The grass seeding will be completed this fall. The past season the entire farm was in oats seeded with sweetclover. The sweetclover and oats straw were plowed into the soil to build organic matter.

F. W. McDermott, Missouri Valley, is president of the club; Bonar B. Wood, Logan, vice president; and Don F. Schwertley, Missouri Valley, secretary-treasurer. Schwertley reports that potential members formerly were dubious about joining the club, as they could not see how it would be possible to convert a gullied farm into a golf course. However, since the conversion, people are asking to join. There are now 185 members.

As far as is known, this is the only golf course that has a complete soil and moisture conservation plan.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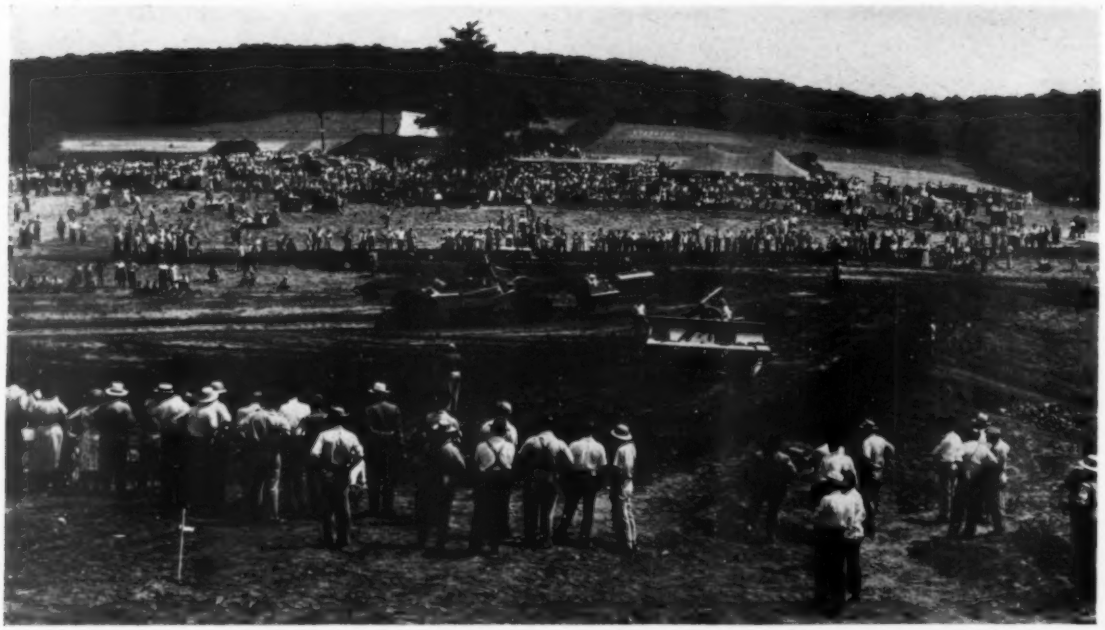


Building a farm pond during a conservation field day in Maryland.

CONTRACTORS AID CONSERVATION

By T. B. CHAMBERS

ON JUNE 30 last year 14,218 private contractors were working with soil conservation districts to help farmers get the needed conservation construction jobs done quickly. They provided heavy equipment, machinery, tools of many kinds, and the operational services necessary for getting the construction job done. When the first soil conservation district was organized in 1937 few contractors operated in this field. There was a gradual development of this contractor work through the war years. The principal increase has taken place since 1945, as needed equipment and labor became available.

NOTE.—Mr. Chambers is chief, engineering division, Soil Conservation Service, Washington 25, D. C.

Whirlwind terracer doing its stuff in New Jersey.

TABLE 1.—*Contractors* [1] *and equipment in soil conservation districts,* [2] *June 30, 1948*

	Wheeled tractors	Crawler tractors	Road patrols	Drag-lines	Power shovels	Ditching machines	Well drillers	Bull-dozers	Pick-up scrapers
Contractor owned	4,983	7,465	1,776	2,023	698	879	1,713	8,465	4,064
District owned	202	160	23	30	0	13	6	172	171
Owned by SCS on loan to districts	102	331	32	101	5	7	2	313	251
National total	5,287	7,956	1,831	2,154	703	899	1,721	8,950	4,486

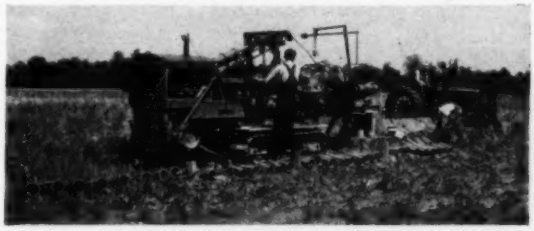
[1] Contractors engaged in soil conservation districts in the fiscal year 1948—14,218.
[2] Districts cooperating with the Soil Conservation Service in the fiscal year 1948—1,924.

The conservation work accomplished by contractors has become such an important activity that districts were asked to make a report on private contractor work and equipment. This report summarizes the number of contractors and the equipment being used in soil conservation districts, Nation-wide.

Dragline cutting a farm drainage outlet in Louisiana.

Of all the heavy equipment used for contract work in 1,864 soil conservation districts, about 95 percent is owned and operated by contractors. The districts operate the other 5 percent on cooperating farms and ranches. Soil Conservation Service equipment on loan to districts amounts to about 3 percent of the total. In addition to these totals, a considerable number of farmers own heavy equipment, which is used on their own conservation work, not classed as contractor work.

The kinds and number of primary machines, such as tractors, draglines, and bulldozers, are shown in table 1. This equipment is roughly estimated to have a replacement value of over $200,000,000 in new machinery. Table 2 gives a summary by the work regions of the Soil Conservation Service. In addition, many other kinds of



With this trencher, up to 3,800 linear feet of drainage tile can be laid in a day.

construction machines, such as blade graders, rotary fresnos, were listed in the individual district reports.

Farm machinery not commonly available on individual farms is also being used by contractors in many districts. The reports listed such things as cultipackers, plows, fertilizer spreaders, combines, slip-scrapers (fresnos), and tree planters. All of this makes it possible for farmers to move along more rapidly with their conservation work.

Many of the practices, such as terraces, farm ponds, drainage ditches, irrigation canals, and land leveling for irrigation, are being applied to the land on a custom basis. It is estimated that over 500 million cubic yards of earth were moved in applying these particular practices in the districts during the fiscal year 1948. In addition, contractors built concrete and other structures for gully control, flood control, irrigation, and similar purposes.

The Soil Conservation Service provides technical assistance to the soil conservation districts for planning, designing, and supervising construction or application of needed practices on lands under cooperative agreement with the districts. While contractors negotiate with individual farmers and receive payment directly from them, the work is planned and installed with the assistance of SCS technicians assigned to districts. The districts adopt a program of conservation suited to the physical, economic, and farming needs of the area. They set up objectives and establish priori-

TABLE 2.—*Regional totals, contractors and equipment in soil conservation districts, June 30, 1948*

Region	Number of—			Wheeled tractors	Crawler tractors	Road patrols	Drag-lines	Power shovels	Ditching machines	Well drillers	Bull-dozers	Pick-up scrapers
	Dis-tricts	Con-trac-tors										
Northeastern	186	914	Contractor owned	35	70	134	86	240	55	13	718	40
			District owned	11	9	9	9	0	2	0	59	5
			Soil Conservation Service loaned.	2	8	6	14	0	2	0	51	18
			Total	48	87	149	109	240	59	13	828	63
Southeastern	353	3,948	Contractor owned	2,915	1,296	202	521	75	46	338	2,169	717
			District owned	70	16	4	7	0	8	1	13	9
			Soil Conservation Service loaned.	4	15	13	21	0	2	0	27	4
			Total	2,989	1,327	219	549	75	56	339	2,209	730
Upper Mississippi	379	2,494	Contractor owned	215	1,615	319	628	182	655	179	1,459	482
			District owned	1	3	2	4	0	2	0	0	23
			Soil Conservation Service loaned.	6	52	0	23	1	3	0	44	11
			Total	222	1,670	321	655	183	660	179	1,500	524
Western Gulf	280	2,961	Contractor owned	1,116	1,132	627	347	23	5	351	1,606	529
			District owned	52	19	4	5	0	0	2	14	13
			Soil Conservation Service loaned.	29	14	3	9	0	0	0	15	3
			Total	1,197	1,165	634	361	23	5	353	1,635	545
Northern Great Plains	356	2,033	Contractor owned	344	1,825	308	194	55	33	305	1,357	1,186
			District owned	48	28	3	1	0	0	0	28	44
			Soil Conservation Service loaned.	27	139	4	11	2	0	0	91	104
			Total	419	1,992	315	206	57	33	305	1,476	1,334
Southwestern	208	1,127	Contractor owned	221	1,016	106	114	53	44	324	686	778
			District owned	17	74	1	3	0	0	1	40	67
			Soil Conservation Service loaned.	34	80	6	7	0	0	0	46	80
			Total	272	1,170	113	124	53	44	325	772	925
Pacific	132	741	Contractor owned	137	511	80	133	70	41	203	470	332
			District owned	3	11	0	1	0	1	2	12	10
			Soil Conservation Service loaned.	0	26	0	16	2	0	2	39	23
			Total	140	545	80	150	72	42	207	521	365

ties. Technicians plan individual farms and arrange for group enterprises covering more than one farm where such action is needed. Farmers cooperate with technicians in both planning and application. Thus, when a contractor comes on the job, farm plans giving detailed specifications have already been prepared. The fact that in soil conservation districts uniformly comparable plans with standardized specifications are used for certain widely applied practices is of great help to contractors. Of still greater importance, the farmer has already arranged with the district to carry out the planned work found to be necessary on his farm. In this way contractors can make quick arrangements with individual farmers who know precisely what they want done, where, and how.

Some principal practices completed in the soil conservation districts of the United States during the fiscal year of 1948 totaled: 30,388 farm and ranch ponds, 87,263 miles of terraces, 4,883 miles of field diversions, 1,089,730 acres of farm drainage, and 217,673 acres of irrigation land preparation.

Contractors are doing an important part of the soil conservation construction work in districts, although there are two other ways to get the job done. Part of the job is being done by farmers who prefer to do their own work and part by districts which own or control suitable equipment. Many farmers like to do as much of the conservation work on their own farms as they can. Modern farm equipment has proved to be efficient for such light earth-moving jobs as terraces, diversions, and small ditches. While some farmers may do such work well, there are many others who would much rather have someone else take over. The larger jobs involve equipment not ordinarily available to farmers. They call for outside assistance. District governing bodies have found it necessary to utilize

certain heavy equipment for purposes of introducing or starting various practices as a means of stirring up interest.

Some preliminary work by the districts is usually necessary to build up a backlog of work sufficient to attract contractors. Districts also need equipment for small, or isolated jobs, for the demonstration of new practices, and in some instances for the encouragement of fair prices in places where there is little or no competition. The district governing bodies may own this equipment or borrow it from public agencies. The Soil Conservation Service regularly loans a small amount of equipment (see table 1) to soil conservation districts. The equipment is then made available to farmers under routing arrangements worked out by the district and usually on the basis of an hourly cost which has been determined as fair.

Contractors operating in districts usually are paid by the farmers on whose land the work is done. Usually, the contracts are negotiated both with individual farmers and with groups of farmers for mutually beneficial projects. There are two main exceptions: First, those contracts awarded by the Soil Conservation Service and paid for with Federal funds for flood control structures on watersheds for which appropriations have been made by Congress and on public land administered by the Service; second, the arrangements made by the Production and Marketing Administration with contractors through agreement with county committees.

Most construction work is of a seasonal nature, although in the southern States contractors are usually busy throughout the year. By far the greatest number of contractors are small operators who have gone into the work of soil and water conservation within the last few years. Often, larger contractors have found it desirable to place construction units on conservation jobs to fill in between their regular operations.

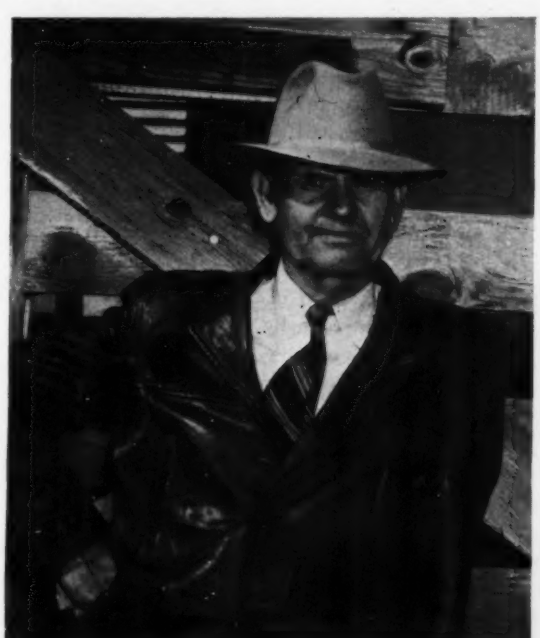
Wheel tractors, disc plows, moldboard plows, and small scrapers are the kinds of equipment used for relatively small operations. Pond and dam builders are usually equipped with crawler tractors, pick-up scrapers, bulldozers, and related equipment. Draglines are used for most of the heavy ditching, while blade-graders and plows are used for shallow field drains. Trenching equipment is used extensively for tile drainage and bulldozers are handy for many jobs, particularly for the clearing of land.

This is a field which affords an attractive opportunity for private contractors, particularly those classed as small business enterprises, and gives promise of expanding considerably in the next few years. Many individuals now make a comfortable living and others are increasing their incomes by performing essential work for their neighbors. It now appears that many of the construction problems that have confronted district governing bodies with respect to use and management of equipment will be partially solved at least by the cooperation of private contractors.

DISTRICT PROFILE

FRANK GYBERG

Arizona



Frank Gyberg, a director of the National Association of Soil Conservation Districts, is affectionately known as the "Mayor of Cornville" to his many friends and neighbors in the Verde Valley and Yavapai County, Ariz. Cornville, located on the banks of beautiful Oak Creek, a permanent stream, has a teeming population of 26 people.

In addition to his duties as "mayor" he finds time to be secretary of the Board of Supervisors of the Oak Creek Soil Conservation District. Two years ago he was State president of the Arizona Association of Soil Conservation Districts. And he has been a director of the National Association since it was organized in 1946.

Frank reads a lot, particularly ancient history. In his readings he has followed various ancient civilizations—Rome, Greece, Egypt, Arabia, and others. These civilizations gradually deteriorated and finally ceased to exist, he finds, as a result of soil depletion and erosion. "It takes a person with only a small brain to figure that our own great Nation is headed that way fast if something isn't done soon and unless more interest and activity are generated to stop the wasteful use and negligence of that thin layer of 7 inches that keeps us all alive and going," he says. "With our steadily increasing population we have got to stop something—either quit having babies or do something about soil erosion, and the Lord knows the latter would be easier."

Frank was born in Ohio and spent his youth there. But while still quite young he drifted to Wyoming and then to Arizona. He followed "cowboying" and worked for many big cattle outfits in northern Arizona until he married and settled down.

Gyberg served in World War I with the famous Black Horse Troop of the Ohio National Guard. He spent several months in France. A natural lover of horses, he never got very far from a steed. "If a horse can't get there, then a man has no business there either," says Frank.

Gyberg and wife, Louise, have been living on the banks of Oak Creek for 25 years, and they have seen acre after acre of valuable valley land washed away by flash floods. They know the value of good land.

Four years ago, when the Oak Creek District was voted in and Frank took office, he knew little about soil conservation. On being elected supervisor he pitched right in and found out what his duties were and how a soil conservation district should function.

Gyberg doesn't pretend to be a farmer. He has about 15 acres of irrigated land but he has planted that to permanent pasture.

"I'm not saving this farm for myself," says Frank. "There's too much work on a farm—I'm saving it for my neighbor's kids!" He makes his living from a herd of whiteface cattle which he runs on adjacent range land of State leases and National Forests.

Frank and Louise have no children but they practically adopt all the kids in the Verde Valley. Mrs. Gyberg teaches them music. Every few months the children give a concert.

Gyberg devotes much of his "spare" time to community drives for such causes as savings bonds, the Red Cross, the Salvation Army, the raising of money for local hospitals and iron lungs. This past year he has taken on something entirely different. He is acting instructor for a class of 12 former GI's who are taking "on-the-farm training" to learn how to farm and ranch. Frank covers the whole field—all the way from soil conservation to how to tie *hondo logos* in the end of a lariat rope. The class is gaining widespread attention. His mail comes addressed to "Dean Gyberg, of Cornville College."

As regularly as every other Saturday rolls around, you will see "Gyberg's Gripes" in the *Arizona Farmer*, the only farm magazine published in Arizona. In this column Gyberg usually philosophizes about something pertaining to his ranch or to his wife. Quite a number of subscribers have told the editor that the main reason they take the paper is to read "Gyberg's Gripes." In their letters they refer to Frank as "The Sage of Cornville."

Last year the six districts in Yavapai County sponsored a school essay contest on soil conservation. A fund of $1,000 was distributed to the winners. Gyberg was one of the key men in this undertaking.

This year, through the efforts of Gyberg and D. H. Dickinson, secretary of the neighboring Bridgeport Soil Conservation District, a successful "Remaking a Farm in a Day" demonstration was carried out on April 27. This was on the farm of R. G. Hardgrave, a pupil of "Dean Gyberg."

No telling what Gyberg and his energetic fellow supervisors will be trying next. But, with all their enthusiasm, interest, and ability, they'll be tackling other big jobs soon. Maybe nothing as spectacular as the essay contest or the farm demonstration, but something equally as effective in getting people to think and live soil and water conservation.

—JOHN D. FREEMAN.

Land Facts

The Guthrie station, together with its nine companion stations, laid the research foundations for the new pattern of agriculture.

By HUGH BENNETT

AT THE EIGHTH annual meeting of the Friends of the Land in Oklahoma City early in October 1948, Superintendent Harley Daniel asked me to visit the Red Plains Soil Conservation Experiment Station, near Guthrie, Okla. It was just what I wanted to do.

We drove up immediately after the meeting. The visit was on the order of a homecoming. I had not been on the station for more than a decade, although it was the first comprehensive soil conservation experiment station to be established in all the experience of man. Moreover, it was the first of 10 such experiment stations established as a result of the adoption by the Congress of the Buchanan Amendment to the Agricultural Appropriation Bill in 1929.

From these 10 stations came the bulk of the basic scientific erosion information that was available when the world's first action program of soil conservation on agricultural land got under way on a national scale in 1933, in the form of the program of the Soil Erosion Service.

I helped with getting this and the other stations into operation, and had general charge of them for several years. There was not much money to work with in the beginning. The Chief of the old Bureau of Chemistry and Soils had given $40,000 of the $160,000 of Buchanan Amendment funds to the Forest Service, and half of the remainder to the old Bureau of Agricultural Engineering. The financial situation was difficult from the start.

One of the things the Amendment called for was the determination of rates of soil and water losses from different types and conditions of land, under different methods of land use and over a wide range of climate. First it was necessary to determine with the utmost accuracy the amounts of soil and water that were being lost from measured

areas of definite types of land used for various purposes. Measurements were made after every rain. The plots had to be so safeguarded that the measurements would cover only the effects of rain falling on the plots. Each plot was steel-encased, except the lower end. At the open lower ends cement tanks were installed to catch every drop of water and every particle of soil coming off the plots. This is the way we measure the effects of erosion and the loss of rainfall.

In order to put in catchment tanks of adequate size, it was necessary to make at the lower end an excavation about 8 feet deep, 60 feet long, and 15 feet wide.

Three of us were at the station when work started. We were enthusiastic and ready to go. The hole was dug forthwith; we saved about $500 of taxpayers' money by doing the digging ourselves. By the time the hole was finished we were all pretty sore, especially in the back. Even now, whenever I hear someone talking about soil 40 feet deep, I instinctively wonder—"where?" Of course, there isn't, and probably never has been, any such depth of soil, not even in the narrow strips of alluvium along the rivers of the world. Those who have not looked below plow depth (about 6 to 8 inches, generally) sometimes assume that topsoil keeps going on down as they see it at the surface, not suspecting that most topsoil goes into subsoil generally at depths ranging from about 3 to 15 or 18 inches and that subsoil is commonly underlain by rock or softer soil-forming material at depths ranging from around 2 to 10 feet—that is, over the uplands of the world (comprising probably not less than about 92 percent of all the agricultural land on earth).

The "40-foot depth of soil" is merely an expression for deep soil.

At any rate, we struck rock at about 3 to 4 feet, leaving nearly 5 feet to go—and that through hard Permian sandstone! Tediously we dug through it with picks—and calloused hands, very sore backs, and some disgust over the greediness of nature toward the development of soil depth.

You don't forget things like that.

More important, the grass-covered plot at the station, over an 11-year period of operation (1930 to 1940, inclusive), lost only 0.22 ton of soil per acre, along with an annual loss of 0.9 percent of the precipitation; while the corresponding bare plot and the continuous cotton plot, alongside, lost 241 tons and 181 tons of soil, respectively, for the 11-year period, along with 27.0 and 11.4 percent, respectively, of the precipitation. Cotton grown in the cotton-wheat-sweetclover rotation lost only 99 tons of soil for the same period, along with an annual loss of 10.07 percent of the precipitation.

As an example of the practical value of this kind of information, look at the water saved from the 5-inch rain at the Red Plains station during the afternoon and night of June 22, 1948. The water stored in the soil had value for plant growth and, of course, it didn't run off the land immediately as so much waste water, adding volume to floods and eroding the soil on its way. The table below gives some idea of what soil conservation means—what it can do:

Rainfall stored in soil at Guthrie, Okla., station

Land condition and use, slope 7.7 percent	Percent of rain of June 22, 1948 (5.08 in.) stored in soil
Exposed clay subsoil, continuous cotton	23.2
Land bare of vegetation, much topsoil removed by erosion	42.3
Land used continuously for cotton, some topsoil removed	56.3
Sweetclover stubble-mulch on topsoil, very little erosion	91.8
Bermuda grass sod on topsoil, practically no erosion	98.2

These are just a few of the many fundamental determinations relating to rates of soil and water losses from various slopes used for various crops that have been made at this station. In addition to these determinations, numerous others have been made, such as the soil- and water-holding efficiency of land terraced with terraces of different length, gradient, and distance apart; and the efficiency of contouring, strip cropping, mulching, basin-listing, crop rotation, grazing according to carrying capacity, and so on.

More than 25,000 measurements altogether have been made at this station, and nearly 300,000 altogether at the 10 stations established with funds provided by the Buchanan Amendment and subsequent legislation.

On one large area of formerly cultivated land, which had been ruined for any further practical cultivation by erosion (all topsoil washed off, with many gullies which had cut down to bedrock) 50 pounds of beef per acre were produced in 1948. This land has been improved by reseeding to grass (little bluestem), mulching with rotten hay and mowings, and grazing according to carrying capacity. When I was at the station the last time previously, 110 acres of this severely eroded land was offered for the use of the station for payment

of the taxes—$18 for the entire 110 acres. The station superintendent had refused the offer, saying it was not worth that much—not even 16 cents an acre!

Later, however, the eroded tract was leased for $30. It was improved and has been used quite profitably for beef production. The 50 pounds of beef per acre which it produced in 1948 brought in, the prevailing price of 23½ cents a pound, $11.75 per acre. The cost of production was very low, probably not over $3 per acre.

Still other profitless tracts of scrub oak land have been leased by the station and put into production under the guidance of careful research. Tracts of such scrub land where nearly all grass had been shaded out were cleared of the scrub growth by treatment with 2–4 D. The first year following such treatment heavy stands of little bluestem and big bluestem grass came in. These reclaimed areas produced 90 pounds of beef per acre this year (1948)at a cost of $6.50 per acre, thus giving a profit of $14.65 per acre. Go back to the price of beef when this land was leased—around 8 cents a pound—and the profit still would be around $4 per acre.

I saw many nice pastures and hay lots in the scrub oak-post oak section between the experiment station and Oklahoma City, which had been cleared according to methods worked out by the station.

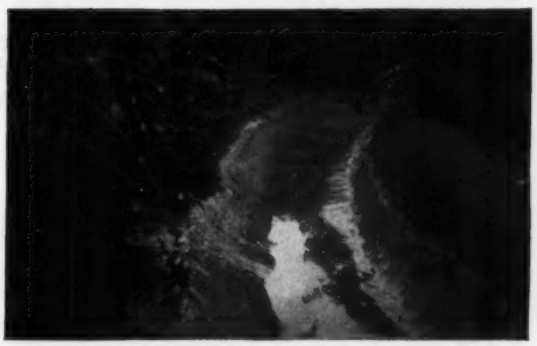
Thus research is being translated directly into action on the land by the farmers of the region, operating in soil conservation districts, with the technical assistance of the Soil Conservation Service.

Altogether there are in the 36 million acres of Red Plains country in Oklahoma, Texas, and Kansas probably 12 million acres, at least, of scrub oak and brush land now producing little or nothing, which could be turned to good use, as needed, in the production of beef cattle and dairying. Ten million acres of this would make enough beef at 50 pounds an acre to give one and a quarter million people a pound a day throughout the year.

This kind of conservation work—that is, putting the results of conservation research to work on the land as soon as we get them—is a part of our great Nation-wide soil conservation program. That makes the country stronger instead of letting it grow weaker by unnecessary erosion and purposeless use of land for growing scrub oak.

This is the kind of research the Soil Conservation Service conducts—that is, the kind that provides the quickest possible answers to practical soil conservation questions which our technicians run into in helping farmers safeguard their eroding lands and make the best use of their lands. Occasionally someone who doesn't understand, recommends that the Service let other agencies do its research work. We do cooperate with other agencies in our research work, particularly with the State experiment stations. I am convinced, however, on the basis of experience that other agencies would never fully understand our continuous, pressing and sometimes immediate needs. Nor would they entirely appreciate the teamwork we have found necessary to get new and vital information quickly out of the test plots and onto the farms and ranches where it belongs. The divorcement of original research from its practical application on the land would result in slowing up the whole soil conservation movement, at terrific cost to the farmer and the Nation.

The affairs of our Nation-wide research program are progressing splendidly—to the extent of very materially aiding the action program of the Service.



TERRACES HOLD FERTILIZER.—José Pinto Pupo, a trainee with the Soil Conservation Service in 1946 and 1947, writes from Baurú, Brazil: "I am sending you some pictures of small terraces that were made this year after a hard rain. The results of this type of work on coffee plantations have been very good. The first year, the trees improved very much. The second year, production increased 20 to 30 percent. A farmer who has 3,000 coffee trees told me that those growing near his terraces look much better than those which have been fertilized but are not on terraced land."

DONGA, DONGA, DONGA!—Dr. M. Wilman, formerly director of the McGregor Museum, Kimberley, South Africa, writes: "The September number of SOIL CONSERVATION has just arrived and I am very glad to have it. I find it so useful both for myself and for my friends. We are trying so hard to get on with soil conservation but our world is so full of slackers. They see nothing but a donga (gully) while our valuable soil is blowing away."

CONSERVATION *in the* Brandywine Valley

A projector tells the Brandywine story convincingly to young and old.

A community looks at its dwindling supply of natural resources and decides to do something about it

By ROBERT G. STRUBLE

ONE hundred and ten applications for soil conservation plans in 6 weeks! That's the amazing record of the newly organized soil conservation district in Chester County, Pa.

"It's a regional and perhaps a national record for the speed with which conservation plans have been requested," says Austin L. Patrick, regional conservator of the Soil Conservation Service.

Who is responsible for this tremendous demand for conservation in Chester County? According to Tom Harney, prominent farmer and chairman of the board of directors of the district, the teachers of agriculture and instructors of veterans on the farms have done much to interest farmers in soil conservation, and the county agents with over 200 demonstrations of contour farming have proved that soil-saving practices pay. Harney says that the other district directors, Paul Coates, Albert Palmateer, Herbert Crossan, and Howard Way are doing a bang-up job of interesting local farmers.

"But one of the biggest reasons for this unusual display of interest in conservation," he points out, "is that there is an independent conservation agency in Chester County, called the Brandywine Valley Association, organized specifically to create *interest in* and *a demand* for conservation."

The best way to see how the Brandywine Valley

NOTE.—The author is a staff member of the Brandywine Valley Association, West Chester, Pa.

W. Martin Muth, SCS technician, and Jack Tingle, GI farmer and first Chester County applicant to district for conservation plan. GI farmers have submitted one-quarter of the applications.

Association has aroused enthusiasm for conservation is to attend one of its illustrated lectures.

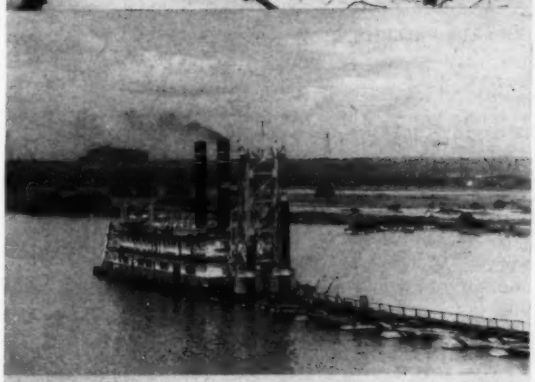
With a brief introduction stating that most people believe there is no soil erosion in a rich land like Chester County, the speaker invites you to take a trip around the county, especially the area drained by the Brandywine Creek, to see for yourself if conservation is really needed. On this trip you never have to get out of your seat for the

Farm forester and Association staff man instruct GI farmers in principles of woodlot management.

Brandywine Valley is actually brought to you by means of natural color slides.

The first picture shows a map of the Brandywine watershed. It tells you that over 200,000 acres of land are drained by this stream which originates in northern Chester County, Pa., and flows through New Castle County, Del., and into the Delaware River. Emphasis is on the fact that the problem is a *watershed* problem. Every branch stream going into the Brandywine must be controlled—then the main stream will control itself.

U. S. Engineers dredge more than 1,000,000 cubic yards of silt from mouth of Brandywine and Christina, at annual cost to taxpayers of nearly $200,000.



In pictures the watershed is put together piece by piece. Beginning as a sparkling spring the main stream is formed by branch streams that flow into it. Then the beauty of the Valley unfolds before you: Old covered bridges, stone farmhouses, little villages, quaint old Meeting Houses—still used by the Society of Friends or Quakers—big cities, old powder mills, and the world's largest plate mill, Lukens Steel at Coatesville. Finally

This, the world's largest plate steel mill, depends on the Brandywine for water.

you see high-producing herds of dairy cattle, thousands of acres of lush green grass, and fertile farm land.

Then the words, "Last year some of our farmers in the Valley grew over 100 bushels of corn to the acre. The average American farmer gets only 35. Here is some of the best land in the world. But

look what's happening to it!" You stare into a gully 10 feet deep, then another, and then you see a whole hillside with most of the precious topsoil washed away. "All that soil was lost in one rain last August."

If you love the land, you have an empty feeling in the pit of your stomach as you look at that picture. The narrator continues: "That may not be your field, but it's costing you a lot of money—in a lot of different ways."

You see the rich soil that left the farm appear as mud in the Brandywine. With additional colored slides you are shown a road scraper shoving the mud off the highway. "Your road-tax money is being spent to push this man's topsoil out of the way. It will never grow any corn out there." Then you see some of the mud going into the Wilmington Water Works. "That mud doesn't improve the taste of the water nor does it cut down the water bill." Here you realize that the farmer and the townspeople have a common problem.

"Most of that topsoil goes on down the Brandywine until the water slows down at the Wilmington Marine Terminal, then the mud settles out." As you glance at a big ship anchored there the speaker continues, "And that same mud fills up that channel at the rate of 12 feet a year. To get the mud out, the U. S. Engineers send in a dredge."

"That's a pretty picture," somebody comments. And the narrator quips, "Yes, and it's costing you a pretty penny so you might as well enjoy it." Somebody laughs a little until he hears, "When you pay your income tax you are paying your share of $168,000 it costs to scoop that mud out of the channel."

"How much mud do they take out?" somebody inquires. "Over 1,000,000 cubic yards per year—enough to cover 1,000 acres 7 inches deep." Before someone can ask what happens to that good soil, you see the Cherry Island Marsh being filled with the once-precious topsoil. "No, it never goes back to the farm. Now it grows ragweed instead of corn."

"It is estimated that 500,000 tons of soil go down the Brandywine each year but we are going to get the exact figure. With the cooperation of the United States Geological Survey and the New Castle County Soil Conservation District, a flow-gaging station has been erected on the lower Brandywine to measure the amount of water going down the stream. And this silt-gaging station determines how much silt or soil is in the water. With the measurements from these stations we can tell how much soil is lost after each rain."

"What have you found out so far?" asks a farmer in the audience.

"Only that on November 4, 1947, during a heavy rain, 13,600 tons of soil went down the Brandywine," is the reply.

"What a price to pay for 1 day's rain!" the farmer exclaims.

"In a few years we hope to prove we can reduce that terrific loss by getting more of our 2,000 farmers in the watershed to adopt soil conservation practices," the lecturer explains. Then he shows a series of pictures to illustrate how the soil conservation technicians have developed complete conservation plans on some of the farms in the valley. Each phase of the plan is vividly portrayed with "before and after" pictures and you get the feeling that there are two important benefits to soil conservation: First, it is practical; second, it pays.

Departing briefly from soil erosion, the program goes into the health and recreational aspects of conservation. To emphasize that the two are interdependent, the speaker shows how muddy water causes poor fishing; how oil from the steel plants

Sediment sampler at Henry Clay gaging station being examined by V. R. Bennion, of the Geological Survey.

and gray-white waste waters from paper mills have created an ever-present "No Trespassing" sign for the boys and girls who would like to swim in the creek; and how raw, untreated sewage pouring into the stream and the rubbish dumped along its banks have turned the once-beautiful stream into an open sewer.

"This is an appalling condition! But let's look at the good as well as the bad." Now you see a series of "after" pictures showing how some industries and towns have cleaned up their waste waters. Emphasis is placed upon the fact that in many cases the industries, through the installation of treatment plants, *have saved money* by reclaiming solid materials that formerly went into the stream. "Although there is a clean-streams law in Pennsylvania that makes waste treatment compulsory, there are not many streams where progress in pollution elimination has been so rapid as along the Brandywine." You get the feeling that the educational program in the Valley has done much to supplement the legislative action and the net result has been good for all.

The climax of the program comes with a picture trip around one of the farms that has been renovated by good use of conservation practices. By the use, again, of "before and after" pictures you see how an abandoned farm was transformed into one of the most profitable ones in the Valley by the adoption of conservation measures. "Corn yields jumped from 25 bushels per acre in 1938 to 101 bushels in 1946; barley from 30 bushels to 80 bushels per acre; and by good pasture management this farm now produces 5 times as much beef per acre as it did in 1938. It's the best evidence we have that if we take care of the land, the land will take care of us," the speaker concludes.

The pictorial presentation nears the end with a gruesome summary of all the things that are wrong with the Brandywine, yet ends on a high note of optimism. It points out that the job of conservation in the Brandywine Valley can be done, and on time, if farmers, townspeople, and businessmen will join hands in common cause to save the land. The final plea of the speaker is, "We need your help!"

During the question period that usually follows the program it is not uncommon for somebody to ask just how he or his organization can help. For any organization, staff members can offer a list of activities designed to aid in the total conservation program: Send a teacher to the conservation workshop. Conduct field trips to see first-hand what is going on. Put on a campaign to reduce grass fires. Encourage people to look at wild flowers and enjoy them and leave them there for others to enjoy. Promote legislation in Delaware to end pollution. Above all, practice conservation on the home farm. Those are a *few* of the suggestions—and the last one is the most important.

How effective has this illustrated lecture been in selling conservation?

"We don't know the answer," says Clayton Hoff, executive vice president of the organization. "We have no exact way of measuring results, but in New Castle the soil conservation district supervisors credit us with having sold one-third of their 162 cooperators on the need for soil conservation plans. Recently after showing our pictures at a parent-teacher meeting, three farmers asked for applications for farm plans. We consider our presentation unsuccessful if we don't get at least one applicant after each program."

The illustrated lecture, however, is only one of the many methods used to create interest in conservation. For more than 2 years now every landowner in the Brandywine drainage area has been receiving numerous booklets and articles on soil conservation from the Brandywine Valley Association. These farmers have also read, or at least have been exposed to, numerous newspaper and magazine articles dealing with the wise use of natural resources. On the first Thursday of each month they may hear a radio program about saving soil, or they may see an exhibit at farm shows or a poster display in a store window—all part of the Association's educational program.

And the young folks aren't overlooked, either. A farmer's son may come home from school with an application for a conservation plan. "Dad, I'd like to have you sign this," the boy will say. "You see, our Future Farmers of America Chapter has entered a conservation contest. Our chapter can get a $50 prize for first place and I can get a free trip to the USDA Experiment Station at Beltsville, Md., if we do enough conservation work on our farm this year. But whether I win a prize or not, it's just good business to save our soil."

Dad usually signs the application.

This FFA boy is representative of 200 in Chester and New Castle Counties who participated in the conservation contest last year. Bankers in New Castle County donated $1,200 for prize money for 4–H and FFA boys. "It earned big divi-

dends," claimed William K. Pennington, president of Rural New Castle County Bankers' Association. In Chester County the Brandywine Valley Association contributed $500 in prize money. These contests resulted in conservation practices being put into effect on 10,000 acres. Both contests are continuing this year—and with greater enthusiasm.

Who pays the bill for this intensive program of conservation education? *The people of the Valley!* By private contributions and membership dues they provide the funds for the Association's numerous educational activities. More than 500 persons living in or interested in the Brandywine Valley have voluntarily joined the organization and supported its activities.

NORTHEAST

CEMETERY SPEAKS.—Joseph W. Robson, seedsman at Hall, Ontario County, N. Y., took some friends to a family burial ground in the nearby town of Seneca. Within a well-kept iron picket fence on top of a small hill they found memorial stones dating as far back as 1813. Farm land on all sides had been tilled for a long time, probably two or three generations.

Topsoil within the cemetery is 24 inches above the tilled soil in surrounding farm lands. This is 1 inch less in surrounding land for each 6 years since the first burial 135 years ago. No one knows for sure that the cemetery was anything but level with adjacent soil at the outset.

Photographs of one field close to the cemetery show small rills, or sheet erosion, in 1948. Corn yields in this particular field were much less than in nearby fields having the same soil types, same seed, same fertilizer and probably the same rainfall.

George C. Moore, district conservationist, Penn Yan, N. Y., who accompanied Robson, said what they observed "is silent testimony rendered by man for all to see, that we do have soil erosion, and plenty of it, on some of our best soil types." Such evidence emphasizes what is happening to our sloping lands, and that the land does not have to be steep for these things to happen.

CONSERVATION ON MARTHA'S VINEYARD.—"Martha's Vineyard and agriculture? That's news to us. We never saw or heard anything about agriculture when we were there," most of the 60,000 people who annually visit Massachusetts' famed vacation and fishing island undoubtedly would say.

But had they been there a certain day last September, they would have learned they had really overlooked something, for on that day agriculture was tops in public interest on the Island, even competing with the famed striped bass contest.

Island farmers have turned to soil and water conservation in a determined way through their Dukes County Soil Conservation District.

On this first conservation farming field day in Martha's Vineyard, more than 200 farmers, other Islanders, and visitors from the mainland flocked to the 65-acre E. B. Keith farm in Chilmark, where men and machines actually applied conservation practices. The field day was arranged by the district supervisors: Chairman Arnold Fischer, John McKenty, and William Pinney.

Keith's visitors saw, usually for the first time, such operations as strip cropping and contouring, the building of diversion terraces, drainage ditches and a farm pond, the reclaiming of old pasture land that had been permitted to grow up to waste or that had become waterlogged, and a start in reforestation to replace fire losses. School children planted a half acre with seedlings. Some of the old stone wall fences were removed and replaced by a few of a better type on the contour.

The *Vineyard Gazette* commented: "Vineyard farmers have great expectations of the services which their year-old organization, and Ezra Shaw, their Soil Conservation Service technician, will be able to render them."

Picturesque Martha's Vineyard, or Dukes County, takes its name from wild grapes native to the Island many years ago. Its known history dates back to 1602 when the first house was built by a white settler. Prior to 1692 it was a part of New York. The Island is in the Atlantic a few miles south of the western arm of Cape Cod. It is 20 miles long and 10 miles wide, and 22,470 of its 67,840 acres are in agriculture—largely dairying and market gardening.

The Island has a year-round population of 7,000, of whom nearly 300 are farmers. In the summer there is an influx of 60,000 visitors, attracted by unusually good boating and fishing, and the many other forms of entertainment and outdoor activities that go with a vacation land.

—ALVIN C. WATSON.

HE SAW THE SOIL.—Leon Mehlenberger, East Springwater farmer, cooperating with the Livingston County (N. Y.) Soil Conservation District, looked underneath the brush and weeds on a semi-abandoned farm. What he found and did about it within 1 year is paying off.

Mehlenberger, Cornell graduate, bought the hillside farm last winter. Its condition was discouraging. There were numerous gullies. Fence rows were overgrown with brush. Little soil was ready for use, but he observed that under the weeds and brush it was suitable for seed-potato production.

Since then, working with a complete conservation plan developed with the aid of SCS Technician Robert H. Walker, he has removed 50 rods of hedgerow to facilitate strip cropping, established 50 acres of contour strips, relocated the farm road, and started construction of a pond to provide water for spraying. Part of the farm, too steep for cultivation, will be reforested. This year Mehlenberger grew 27 acres of potatoes for certified seed.

In a group of 370 farmers cooperating with the district, Mehlenberger was chosen to "carry the ball" in a conservation contest because he has made the most progress in establishing a complete erosion control program.

CIVIC-MINDED GRANGE.—There's much enthusiasm for farm ponds in Harford County, Md. The local Grange has completed a pond for Churchville, near Havre de Grace, as a community project. Members provided the site and did all the construction work except for bulldozing. The pond covers one-half acre and is 2 to 12 feet deep. It will be used for community fishing, skating, and fire protection. SCS technicians supervised construction.

CYRUS HAS FRIENDS.—One day last October 80 young farmers, training as veterans under the GI bill, pitched in on a 1-day 6-point soil conservation project designed to help a buddy. Neighboring farmers joined in. Some who came to observe, stayed to help. The work accomplished ordinarily would have taken at least 4 days. Equipment was provided by the Wayne County (W. Va.) Soil Conservation District. The buddy was Garland Cyrus, 27-year-old disabled veteran.

In that 1 day the group built a 1,400-foot diversion terrace across a 15-acre hillside tract to protect other fields and a poultry house from runoff, laid out and plowed eight 60-foot strips across the field for strip cropping, sowed grass and permanent meadow mixture on the terrace; constructed a 300-gallon stock-watering tank, prepared and sowed a 3-acre field with wheat and vetch for winter cover crops which will be plowed under in the spring, remodeled and repaired the poultry house, and surveyed a 10-acre timber tract for selective cutting. Men of the Soil Con-

servation Service and the Veterans' Administration directed activities.

Cyrus, 70 percent disabled by mortar shell wounds received in battle near Strasbourg, Germany, joined with his buddies and other friends and helped get the job done. He seemed bewildered by the extent of work accomplished. "It would have cost me at least $2,500," he said. Most of the veterans brought their lunches. For the others, Mrs. Cyrus and several neighbors prepared a chicken dinner. Cyrus' principal industry is chicken farming.

TRANSIENT TOPSOIL.—Runoff from 40 acres destroyed or damaged the crops in a low-lying field farmed by the Jablonski brothers at Bridgehamton, Suffolk County, Long Island, N. Y. When all suggested methods for dealing with the problem resulted in failure, they hit upon the idea of trying to drain the water into the underlying sand and gravel. They hired a crane and dug a catch-basin 120 feet long, 20 feet wide, and 15 feet deep. When heavy rains came, water disappeared in the hole and was quickly absorbed. There was no crop flooding even in August, a record for rainfall.

That was in 1946. In the following years, everything went smoothly until this past summer when another problem developed. In 2 years 7 feet of topsoil had been carried into the hole. This reduced its effectiveness. This past fall the Jablonskis cleaned out the catch-basin and hauled 800 tons of topsoil back to the fields from which it came. They observed that it had been deposited in layers. By counting these and noting the thickness, they were able to determine the number and frequency of storms since the hole was dug.

The Jablonskis believe the plan can be used on many farms where the water table is not high. Beyond service in handling runoff water, they say the experiment has taught them the vital importance of soil conservation. The 7 feet of topsoil has been a mighty powerful object lesson.

HATCHERIES BUSY IN EMPIRE STATE.—New York State farmers are taking to farm ponds like ducks to water. A report from the Mohawk Valley says there are 115 farm ponds in Oneida County and 81 in Madison County, compared with 2 to 1, respectively, in 1944. Farmers have built these ponds in cooperation with their soil conservation districts as a practice which assures an ample supply of livestock water, a means of water control and fire protection, and recreation areas and fish production. At Lamar, the *Utica Daily Press* notes, "New hatcheries are being built and old hatcheries repaired in an effort to double the fish output for pond stocking." In 2 days, recently, 57 farmers in the two counties received more than 21,000 bluegills and bass for their ponds.

SOUTHEAST

THEY WORKED TOGETHER.—*Soils, Geology, and Water Control in the Everglades Region*, a new publication designated as Bulletin 442 by the University of Florida Agricultural Experiment Station, is long overdue but well worth waiting for.

This bulletin of 168 pages, complete with a pocket of color maps, is distinguished for its comprehensive treatment of basic material and for its fine example of agency cooperation. No better example has come off a printing press of what can be done when major forces pinpoint a problem and join wholeheartedly in its analysis. The bulletin was prepared under the direction of Lewis A. Jones, chief of the division of drainage and water control, Soil Conservation Service, but it represents equally the thinking and sponsorship of the Florida station, the U. S. Geological Survey, and the Everglades Drainage District.

Bulletin 442 lays a fundamental and integrated basis for the program of water control and utilization in the Everglades. The historical and scientific background is included, together with an outline of control works contemplated, probable costs, and recommendations for land use and management. It is rounded out by bibliography and numerous acknowledgements.

—W. B.

SOIL CONSERVATION SALESMEN.—The soil conservation program must be sold to *everyone*—ourselves, district supervisors, farmers, and the general public. This was the theme of a talk made by Hugh J. Dowdle, district conservationist of Denmark, S. C., recently before a State meeting of Soil Conservation Service workers at Clemson College, Clemson, S. C.

Dowdle advocated the use of time-tested sales methods. "We first must sell *ourselves*—the people whose job is to help farmers plan and apply complete soil and water conservation programs," he said.

To do so, SCS workers must realize that they have the best possible product to sell; and that they should know this product from A to Z. They must do their job in a professional manner, use good judgment and common sense, and be enthusiastic.

"District supervisors must be sold on the district program both as farmers and as a governing body," said Dowdle. "Helping them to see and understand the problems of the district, to make decisions and determinations that will lead toward solving these problems, and to enlist the active support and help of those able to assist, is an important job we cannot fail to do."

In selling farmers, he urged that the district be kept in the limelight. The use of testimonials and experimental findings, field studies of complete plans successfully applied by other farmers, illustrations and photographs, and the group approach were methods recommended.

Local newspapers were considered the most useful medium for telling of conservation activities and farmer experiences that would sell the district program to the general public. Other ways listed were: Getting information before civic clubs and schools, using appropriate picture displays in bank lobbies and cross-road stores, field studies for business people on individual farms where land use and conservation practices have been applied successfully.

"Most important of all is that each of us do a good, thorough, complete job. If this is done the farmers and others will help sell our product."

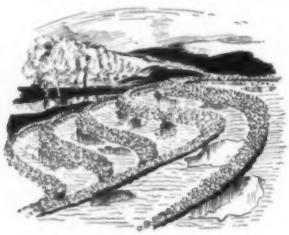
URGES SUPERVISORS TO ACT.—Soil conservation districts have not accomplished as much as they might because district supervisors have placed or allowed to fall on Soil Conservation Service employees responsibilities and duties that the supervisors themselves should assume, according to A. T. Minchew, supervisor of Georgia's Satilla River Soil Conservation District.

Minchew, speaking to a group attending the Conservation Short Course at Abraham-Baldwin College in July, said, "We have not realized or given proper recognition and publicity to the fact that the soil conservation district and the Soil Conservation Service are two separate and distinct organizations.

"The Soil Conservation Service is a Federal agency that has rendered great assistance to the districts in carrying out their programs by furnishing trained technicians to help apply practices that the supervisors think beneficial. The employees are here, however, only at the request and invitation of the district supervisors, and can do only those things authorized by the supervisors of the respective districts."

RE: WHY WASTE WOOD?—McIntyre's "Why Waste Wood?" in the November issue of SOIL CONSERVATION Magazine stirred up phenomenal interest. Reprints are available in limited numbers. Requests should go to William L. Robey, Printing and Distribution Unit, Soil Conservation Service, USDA, Washington 25, D. C.

UPPER MISSISSIPPI



TRAPPED ON RIDGE TOP.—"Terraces certainly keep water from moving off high flat ridge tops and down steep side slopes," reports Ted Johnk, cooperator with the East Pottawattamie (Iowa) Soil Conservation District.

"By preventing this movement of water, my soil has been kept on the hill where it belongs."

This is the first year that Johnk has gone into the extensive use of mechanical aids to assist him in soil and water conservation. Early in 1948, he constructed a 1-mile terrace which protects 25 acres of land. All of his row crops are planted on the contour.

In May a 3½-inch rain fell on Johnk's farm in 30 minutes. All of the rain falling on the ridge top was trapped by the terrace. This eliminated severe soil, water, and fertility losses.

Johnk said that it has long been known that floods start at the top of a hill. He added that if all the farmers within the area of the May rain could have had their hilltops terraced and their fields contoured, the flood on Graybill Creek would have been cut down considerably.

CONSERVATION FIELD DAY.—Nearly 5,000 people attended the First Southwestern Illinois Conservation Field Day held on the farm of O. W. Niermann near Carlyle in August.

Tents were set up, a public address system was installed, and implement dealers displayed many types of farm machinery and equipment. Terrace outlet construction was explained by William Culpepper of the Soil Conservation Service.

At noon an address was given by Prof. J. C. Spitler, associate director of Agricultural Extension, University of Illinois. The men's quartet of the University of Illinois sang; and Monsignor George J. Hildner from Missouri, Mr. Sherrill, president of the Farmers Club of St. Louis, and Hugh Steavenson, secretary of the St. Louis Chamber of Commerce were introduced.

During the afternoon, C. A. Kincaid gave a talk on the "Missouri" type flume which was being constructed.

One of the main events was the contour plowing contest. Prizes were announced by the Honorable Arnold P. Benson, State Secretary of Agriculture. The winner of the first prize, a bronze plaque and $100, was a contestant from Fayette County.

—IRMA M. NOLD.

KNEE DEEP IN PASTURE.—When a group of 25 bankers and businessmen visited the Lyle Ahrensmeyer farm in the Sauk County (Wis.) Soil Conservation District recently, he gave them an emphatic account of the value of soil conservation farming. He led the group up the hill away from his well-kept farm buildings and stopped at a field fence to say:

"See my cows over there knee deep in pasture. That's some of my alfalfa, brome, and clover mixture that I don't need for hay. That's my rotation pasture which has old and new strips of seeding in it. Now look at the bluegrass where you stand. There isn't much there is there? It shows how much more crop we can have if we lime, fertilize, and seed our land to legume-grass mixtures." Ahrensmeyer showed the group an excellent renovation on which the ground had been prepared last fall and reworked this spring.

"When I first moved to the farm," he continued, "it was badly worn, having been cash rented and farmed hard. Something had to be done and 7 years ago I started on this conservation program. Since that time my barn has been enlarged and I now fill it with hay alone. Not only am I raising two to three times more feed but the farm is paid for and I feel pretty good knowing that my fields aren't going to wash away as long as I have good seedings and good pasture."

SHOWING 'EM IN "SHOW-ME" STATE.—Out in Franklin County, Mo., 255 farmers will soon be telling the world that they are cooperators of the Soil District of Franklin County as a result of action taken recently at a meeting of the district governing body. The board awarded cooperators honor posters made of a durable weatherproof material which will be placed at the farm gateway or at some other conspicuous spot along the highway.

These posters are being furnished free of cost to the farmers by the district. A small surplus of funds left over from rentals on the district bulldozer is being used for this purpose.

The district governing body also voted to award the same honor poster to all future cooperators at the time their completed farm conservation plan has been approved.

In a newspaper release published at the time the award was announced, the Right Reverend Monsignor George J. Hildner, V. F., chairman of the Franklin County district board, issued a general invitation to all farmers of the district urging them to cooperate in the complete program. Organized in 1944, the Franklin County district has 3,400 farms. In addition to the 255 district cooperators, there are approximately 1,700 farms on which the owners have applied one or more individual soil conservation practices in cooperation with the PMA program. The district is urging these farmers to expand their individual practices into a complete farm conservation plan which will reduce runoff, control soil losses, and put every acre to its best use according to its capabilities.

William C. Shotwell is district conservationist and Glen E. Burk, work unit conservationist.

STAYS WITH CORN.—Soil conservation really has made a lot of difference to Carl Hollman, a cooperator with the Allen County (Ind.) Soil Conservation District. It has not only checked erosion, increased yields and income, but also saved him from being forced to change his type of farming.

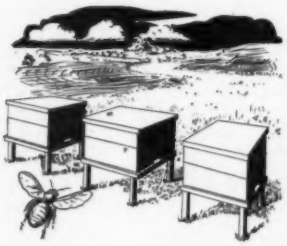
Two years ago gullies were carrying his best soil away to St. Mary's River. One gully had split a field so he couldn't farm it as a unit. He had about decided to quit corn and start a grassland type of farming.

Then he developed a farm conservation plan with the help of Glenn Poe, SCS work unit conservationist. He planned to use the land according to its capabilities. Some of his land is practically level but much of it needs terraces, contours, cover crops, and grassed waterways, as well as good rotations and fertilizers.

Terraces stopped most of the washing and some of the gullies were prepared and seeded to permanent waterways. Cropland has been arranged in five fields of about 15 acres each, which are farmed in 5-year rotation. One of his terrace systems enabled him to continue farming a field which otherwise would have had to go for hay. This enabled him to continue raising corn.

Hollman says that he is well satisfied. He is getting more of each crop, has more feed from his renovated pastures, can continue to grow the crops he prefers, and finds his soil still in place after each rain.

WESTERN GULF



BUSY BUZZERS.—Fifteen billion workers for Texas soil conservation! Bees!

At least that might be a popular interpretation of the resolution passed recently at the annual meeting of the Texas Beekeepers Association.

Addressed to Waters Davis, chairman, Association of Texas Soil Conservation District Supervisors, the resolution stated that the beekeepers are concerned over the damage being done to Texas agricultural resources by soil erosion, that they feel beekeepers have a contribution to make by providing pollinating services for soil-conserving plants, that they are interested in working with soil conservation districts for mutual interest, and that they favored State and Federal legislation which would support and strengthen soil conservation district activity. The resolution was comparable to one passed early in 1948 by the National Beekeepers Association of Salt Lake City, Utah.

One of the principal speakers was Philip F. Allan, chief of the regional biology division, Soil Conservation Service, who revealed that during 1946, in seven of the State's 148 soil conservation districts, more than 80,000 acres of vetch, Hubam, and Madrid clovers had received pollinating services from beekeepers, with yields increasing from 100 to 200 percent, and in many cases even more.

An increase of 170 pounds of vetch seed per acre was attributed to bee pollinating services by Bill Cunningham, of Greenville, Tex. The use of only four hives of bees on the 23-acre field of hairy vetch and barley on the Harry Rogers farm near Tulia was equally significant. Near the hives almost 90 percent of the seed combined was vetch, while at the other end of the field the yield was 90 percent barley. The over-all yield of vetch was 75 percent more than in the previous year.

SOUND ASSURANCE.—Whenever the supervisors of the Denton-Wise Soil Conservation District in north central Texas want to show sound movies on conservation subjects to groups of farmers, businessmen, or students they will no longer have to beg, borrow, or steal a sound projector. They now have their own.

Recently the supervisors learned about a $200 sound projector on sale at a Fort Worth store for $178.50. They quickly sent a fleet-footed emissary off to buy it. Now they can show sound movies on soil conservation subjects whenever and wherever they want to. Of course, they have to have the movies, but they're easy to get in comparison with a sound-projecting device.

PRIZES FOR LEGUMES.—The Saline Soil Conservation District, in northwest Louisiana, is conducting a contest to stimulate the use of winter legumes. The district will award first, second, and third prizes of $50, $35, and $15 to contestants planting at least 5 acres of Austrian winter peas, hairy vetch, Dixie wonder peas, Singletary peas, or some other winter legume.

Entries are to be judged early in March. Prizes will be presented at a district-wide meeting at Ringgold.

GETTING RID OF BRUSH.—From July 1, 1947, to October 1, 1948, the Soil Conservation Service research station at Guthrie, Okla., received 313 letters of inquiry about the control of brush on farm and ranch. Brush control is one of the station's research projects. The station is in charge of Harley A. Daniel.

The letters came from 47 States and four foreign countries. The only State not represented in the correspondence was New Hampshire. One letter each came from Guatemala, the Territory of Hawaii, the Territory of Cuba, and three from Canada.

From Oklahoma came 133 letters; Texas, 29; Missouri, 25; Ohio, 20; and Kansas, 11. They were the four highest States.

Left, Harold. Right, Hartzell. (We think.)

DOUBLE EXPOSURE.—Identical twins in the Fort Worth regional office of the Soil Conservation Service have confused their friends over the years. Dr. Harold L. Dean is chief of the cartographic division. Dr. Hartzell C. Dean works on flood control.

Recently, Harold went to a strange barber shop for a haircut. A little later Hartzell went to the same barber for a haircut. The barber couldn't understand how that hair had grown so fast!

The Deans are products of Iowa State College. They joined SCS the same week in 1935. Harold has a boy, 10, and a girl, 5. Hartzell has a son, 13, and two daughters, 10 and 7.

NORTHERN GREAT PLAINS

GRASSY ACRES.—Ben Nedrebo uses grass in his crop rotation. He finds that the income from grass seed, livestock, and improved crops adds materially to his profits. Ben farms 1,200 acres near Argusville, N. Dak. He is chairman of the board of supervisors of the Rush River Soil Conservation District.

"We keep some cattle," he says. "We make something off them but that isn't the main reason we have them. We figure that the crops that follow grass and livestock make grass a paying practice. What we get from the grass seed and livestock just make it that much more profitable."

Nedrebo's conservation plan includes crop residue management and improvements in the farm drainage system. The farmstead windbreak, started 20 years ago, is the

second in the same place. The first was planted when the land was settled and had outlived its effectiveness.

Nedrebo's system provides 200 acres of grass for grazing each year and 200 acres more grass seeded each spring. It's a short rotation, 3 years, using meadow fescue only. He usually gets some seed the first season, grazes the grass the second season, plows it up the following spring and seeds another 200 acres to grass. Some years he also gets seed from the land being grazed. Seed can be taken off around July 10. The field is then grazed the balance of the season. This grass is left on the field from 2 to 3 years and then plowed under.

"Getting grass roots into the soil is one of the best things we do," Nedrebo said. "It keeps this heavy soil in good condition, easier to work and able to take in water and hold it better. And the grass roots and the manure the livestock leave do much to keep up the soil fertility.

"This shows up best on the home place, where the grass rotation has been used for many years. The soil is mellow and easy to handle. It will not blow easily. And crops are better and less affected by the weather. We can count on good crops there, even in rather dry periods."

Last spring, Nedrebo tried stubble-mulch tillage on half of one field of wheat. During the wet weather, the water soaked readily into the stubble-mulch-tilled land. On the plowed section of the field, water stood on the surface a long time.

ONE LITTLE WATERSHED—AND THEN ANOTHER.—Because of conservation on land drains, a small, intermittent creek through the Harvey A. Whitehead farm near Syracuse, Nebr., hasn't made any headway in filling the channel with silt above three concrete drop structures. Instead, water in this little watershed is kept under control from top of slope to mouth of creek. As much of the water as possible is saved on the land for grass and crops. Any excess has to creep slowly to the creek, instead of sloshing along kicking up soil. In the creek, the water is still under control because of the structures.

This, in miniature, is the watershed and small tributary flood-control program for the whole Missouri River Basin.

"I can see the difference in the way the creek acts," Whitehead explains, "because part of this farm was my dad's and I've lived here all my life.

"When we were kids, we used to run down to the creek after a rain. It would be running full blast. But now, it takes quite a while for the creek to start running even after a heavy rain."

About three-fourths of the watershed and nearly all the creek channel are in Whitehead's 480-acre dairy farm. The upper quarter of the watershed is part of a neighbor's farm, where a conservation program like Whitehead's is in effect.

The measures that control the water so well are the result of long effort. Whitehead, a member of the board of supervisors of the Otoe Soil Conservation District, began work on his conservation plan 12 years ago. Soil Conservation Service technicians helped.

Whitehead's steeper land is terraced and seeded to grass for hay and pasture. The cropland is terraced and contour farmed, with the terraces emptying into a system of grassed waterways. His crop rotation makes frequent use of a grass-legume mixture. Pastures are handled to keep a dense grass cover on the land.

The three drop structures were built in 1946 to control the water after it got into the creek and to stop three overfalls—small waterfalls—from advancing up the creek bed. They were turning the channel into a sizeable gully and water ran fast enough in the creek to erode its bed.

The structures are small concrete dams 2 to 3 feet higher than the creek bed at the overfalls. A concrete apron extends downstream from the bottom of each to keep the falling water from digging into the creek bed.

With the excess water forced to move slowly to the stream and the structures both controlling the overfalls

One of three structures on Harvey A. Whitehead farm near Syracuse, Nebr., built to control overfalls. Upper view is some distance above structure, where channel is stabilizing because flow from watershed is controlled. The watershed is now fully protected by a complete conservation plan.

and holding back part of the stream flow, the creek can no longer erode its bed or banks.

"I think the severest test came last February when we had a fairly heavy rain," Whitehead said. "The soil was frozen, except for a thin layer, so the water couldn't soak in. So far as I could see, my land wasn't hurt a bit. Nearly all of the water ran off because the ground was frozen, but the contour rows in the fields, the terraces, and the grassed waterways kept it from getting in too big a hurry.

"It was quite a bit different on another little watershed not far from here. I saw some fields that were just about cleaned off down to the frozen earth. That topsoil was washed away."

The little watershed where Whitehead lives is one of several that make up the drainage area of a stream that empties into the Nemaha River. Most of the other little watersheds in this drainage are just about as well under control, and it is expected that the work on these will be finished soon. Together they amount to several thousand acres.

The work of farmers cooperating with the Otoe Soil Conservation District is shaping up to control 18 such drainage areas. Farmers and SCS technicians have worked out plans for nearly all of the land in these drainages. In some, 80 to 90 percent of the work of applying the practices has been done. In others, it is as low as 40 percent but moving ahead well.

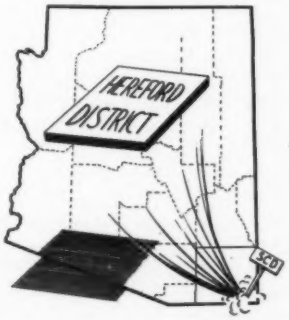
"Sure, this helps the folks downstream," Whitehead continued, "but it helps us, too. We need this soil to

keep on farming. And conservation pays in production. I know my total production is larger. I cultivate less land to get the same amount of crops. But the land I've taken out of cultivation is still producing—it's producing hay and pasture."

When all the little watersheds in the Nemaha drainage are protected in the same way, you'll have about the same situation you find on this little watershed. Soil will be kept on the farms and ranches where it can continue to produce food. It will not become sediment to damage bottom lands and crops, choke stream channels, and silt up flood control dams or reservoirs.

—A. E. McClymonds.

SOUTHWEST



LITTLE FELLOW Z-O-O-M-S.—In the last 18 months the Hereford Soil Conservation District in Cochise County, Ariz., has grown from 1,500 to 2,600 cultivated acres. This growth has been within the original district boundaries and the growth is continuing. The Hereford district doesn't grow by annexing new areas but by leveling waste land and making it productive.

This is one of Arizona's smallest agricultural areas, lying along the San Pedro River in the southeast part of Cochise County and having the Mexican boundary as its south line. In percentage, the expansion is the most rapid in the State. The soil of this area, which is highly productive under irrigation, is attracting farmers. The irrigation water is being obtained from shallow wells which, so far, have shown no signs of serious groundwater depletion.

"RUINING" FARM PROVES PROFITABLE.—"You're just ruining my neighbor's farm," commented Ed Nelson, farming in the Hondo River Valley near Tinnie, N. Mex. He was speaking to Tom Utterback, representative of the Soil Conservation Service, as he watched technicians stake out bench terraces for land leveling on a nearby farm.

Nelson's attitude was friendly, but there was no mistaking his meaning. He merely thought soil conservation was "a bunch of plain foolishness." That was in 1945.

In the spring of 1947, after having observed the results of conservation methods on his neighbor's farm for 2 years, Nelson was convinced that he had been wrong. He became a cooperator of the Upper Hondo Soil Conservation District and invited SCS technicians to help him "ruin" *his* farm, as he put it.

Nelson's 22-acre farm is used to provide supplemental feed for sheep and cattle. About half of the farm was bench-leveled in 1947 and finished up early in 1948. Now Nelson is one of the most avid supporters of soil conservation in the Hondo Valley.

"It used to take me about a week to irrigate, but now I can do so in 8 hours," Nelson says. "I use only half as much water and do a better job. My corn yield has been increased by a third, and my hay crop has been doubled. The hay is more uniform and of better quality."

PETERSON'S NEW LOOK.—Five years ago Art Peterson of Bear Creek, Colo., had an eyesore between his house and the highway. This was a 3½-acre tract of rough ground which had become a weed patch.

Petersen asked the Jefferson Soil Conservation District to help him out. A complete farm plan was made which included the leveling of the weed patch. An SCS man did the surveying, and the district provided leveling equipment.

Topsoil was stockpiled and subsoil was moved into the low spots and covered with the topsoil. In one instance a cut of about 5 feet was involved. The leveling cost Peterson $187.

Then the former weed patch was given manure and seeded with a mixture of smooth brome, orchard, meadow fescue, alfalfa, and yellow sweetclover.

Last year 19 steers grazed on these 3½ acres from June 1 until frost. The steers were taken out only during irrigations. The grass grew faster than the steers could eat it during the first part of the season, so Peterson cut 74 bales of hay as an extra dividend.

NEIGHBOR HELPS NEIGHBOR.—It's all for one and one for all among the 235 farmers cooperating with the Timpanogos and Nebo Soil Conservation Districts in Utah County, Utah.

Members of the two districts have joined in the purchase of a 30-foot land plane to be used to put the finishing touches on fields that have been roughly leveled.

Land leveling in Utah is one of the most important objectives of the conservation program on irrigated land, according to Dale Schott of the Soil Conservation Service. Schott reports that there are 96,700 acres of irrigated land under cultivation in the two districts and figures that the land plane can be used on at least 65 percent of this area. This, he says, can result in an increased crop production of from 5 to 30 percent, provided other necessary conservation practices are carried out.

GRASSES LICK GULLY.—"On 30 acres where one cow once would have starved, I'm now grazing 20 cows half the year and still have sufficient vegetation to control erosion," says Gerald Johnson, a director of the Lower-Cobolla Soil Conservation District, in Rio Arriba County, N. Mex.

When soil and water conservation operations were started, there were many small gullies leading into a deep arroyo. Sagebrush and other undesirable vegetation occupied the remainder of the land. Production was decreasing and erosion was increasing.

Johnson fenced the area about 10 years ago. He then cleared the sagebrush and obtained the aid of SCS engineers in terracing 5 acres. He found that one of the cheapest and most effective practices was the planting of a mixture of brome, western wheat, bluegrass, sweetclover, and timothy in the severely eroded areas where runoff water accumulated two or three times annually.

In addition, Johnson planted 3 acres of alfalfa in rows which now produce 5 tons of hay annually. He also built a stock tank which helps control erosion in a gully. Three acres were planted to wheat and rye for winter pasture.

"I manage the grazing of my cattle so the plants can produce seed annually," Johnson explains. "This allows the plants to become stronger, so they produce greater quantities of feed and also control erosion in both the main and side gullies. Where there originally was a gully about 1,500 feet long and 50 feet wide, good grass now is providing grazing for five cows for 5 months annually."

PACIFIC

L. A. Joslin (left) netted $6,000 profit the first year of conservation farming near Redmond, Oreg. With him in barley field is Anton Winkel, SCS technician.

EVEN A NOVICE CAN SUCCEED.—L. A. Joslin, postwar farmer of Redmond, Oreg., gained $6,000 from his first year's experience with conservation farming.

Middle-aged Joslin left the humdrum of a Los Angeles welding shop to tackle agriculture on an 80-acre farmstead.

A year ago Redmond SCS men helped Joslin work out a farm conservation plan, the first in Deschutes County's newly formed Mid-State Soil Conservation District.

One look at the old irrigation system in use on his farm showed it was washing soil away down to the volcanic ash cinders. Some parts of the acreage had too much water. Crops in other areas were thirsty.

The job of rebuilding his farm along soil-conservation lines, will take about 5 years, Joslin figures. "I'm only getting well started. But even a novice has a good chance these days."

PLANTING BY PLANE.—"What next by air?" Southeast Washington folks were getting pretty well accustomed to farmers using planes for such farm chores as spraying, dusting, fertilizing, and predatory control up to a year ago. Then, last spring, the first sweetclover-laden plane made farming history in the Walla Walla Soil Conservation District by sowing a field quicker than it had ever been done before.

Pin-point sowing of more than 10,000 acres of top-producing wheat and pea land is the latest step to quicken the pace of soil conservation work—from the air.

Taking to the air to speed up their early spring farming, district cooperators sowed nearly 100,000 pounds of clover seed during a 30-day period, ending in late March. Many wheat-pea men see in aviation a way of getting farm jobs done faster, earlier, and better.

When SCS technicians checked up on the trend of farming practices a few years ago, they found that only a few farmers were seeding sweetclover for a green manure crop. Ranchers hedged on using the practice because sweetclover, being a biennial crop, turned under the second year, put land out of production for a year in a wheat-fallow cropping system and 2 years in a wheat-pea rotation.

With prevailing top grain prices and the national call for more and more food, most wheat-pea ranchers said the work load was too great to warrant taking their acres out of production. Most of them sought ways of holding on to sweetclover as a green manure crop and as a soil-saving legume.

Using standard farm equipment, drilling or broadcasting of clover seed is delayed each spring until the ground is firm, to prevent damage to the grain crop.

Two years ago Elbridge Bacon, of the Walla Walla SCS staff, watched farmers dust peas by plane for weevil control. Bacon got the idea that seeding at 25 feet wouldn't be any tougher than dusting at 10 feet above the ground.

Walla Walla ranchers thought Bacon's air-seeding plan worth trying. That spring 12 of them agreed to try plane-sowing of clover seed on 2,000 acres.

This spring a larger number of farmers sowed clover by air. The mark of 10,000 acreage seeded is expected to be stepped up again in the spring of '49.

Here's how airplane clover seeding is done. One flagman is stationed at each end of a field. After each flight run they move 35 feet across the field. The seed spread is about 70 feet, allowing for a 20-foot lap on each round.

Air seed broadcasters stay on the ground when the wind whistles over the wheat lands. Even a light breeze will blow the seed off the target. But, when sowing conditions are right, a pilot can hit a hat on the ground with from 8 to 17 seeds on each flight over a field.

Joe F. Martin, who has 300 acres of air-sowed clover, sums up a common attitude: "We've got to do something while we have enough soil to do it with. Planes are helping us speed up the job of saving our soils and we're getting good sweetclover crops for green manure without taking our land out of production."—Herb Boddy.

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